NJ Green Homes Office

Solar Financing Handbook

February 2009

INTRODUCTION

This tool was created by the NJ Green Homes Office to be used by any New Jersey resident or business considering a solar photovoltaic installation and to enable you to make an informed decision. The Solar Financing Handbook and accompanying Solar Financing Tool are updated annually.

Please note that this is a quick guide and not an in-depth explanation of solar photovoltaics. Topics are covered with the intent to aid in making an initial decision to invest in this technology. If you have any questions about this tool, would like to know more about the assumptions used, or have information that will make the tool more accurate, please contact the NJ Green Homes Office by email: njgreen@njhmfa.state.nj.us

Check out our website at www.njgreen.gov

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DISCLAIMER

The HMFA and the NJ Green Homes Office, it's officers, employees or agents shall not be liable for damages or losses of any kind arising out of or in connection with the use or performance of information, including but not limited to, damages or losses caused by reliance upon the accuracy or timeliness of any such information, or damages incurred from the viewing, distributing, or copying of those materials, [specifically this document and related Solar Financing Tool].

BACKGROUND INFORMATION

Governor's Executive Order 54

Executive Order 54 was signed February 13, 2007 and (1) calls for a reduction of Greenhouse Gases to 1990 levels by the year 2020; (2) further requires a reduction of projected 2006 Greenhouse Gas levels by 80% by the year 2050; and (3) directs the Department of Environmental Protection (DEP) to develop measurement standards, monitor reductions, and coordinate an implementation plan to meet these goals with other state initiatives. Executive Order 54 can be found at http://www.state.nj.us/governor/news/orders/. The Department of Environmental Protection has a draft report available – meeting these requirements and those indicated in the Global Warming Response Act. Updates can be found at http://www.nj.gov/globalwarming/

Global Warming Response Act

The Global Warming Response Act, bill numbers S2114/A3301, was passed by both state houses on June 21, 2008 and approved on July 6, 2008. This bill mandates that the goals of the Governor's Executive Order 54 be met, sets timelines and provides further details and direction. The bill can be found at http://www.njleg.state.nj.us/2006/Bills/A3500/3301_R2.PDF

Energy Master Plan (EMP)

A few goals of the NJ Energy Master Plan are (1) to reduce total energy consumption in New Jersey by 20% by the year 2020; (2) to have 30% of total energy consumed come from renewable energy sources by the year 2020; and (3) to provide for a continuing supply of energy at a reasonable cost while meeting the state's sustainability goals. The goals of the EMP are consistent with and help meet Greenhouse Gas reduction requirements as directed in Executive Order 54 and the Global Warming Response Act. More information on the NJ Energy Master Plan can be found at http://www.nj.gov/emp/index.shtml. On page 12 within the 'Goal 3' introductory section of the EMP is found a breakdown of renewable energy goals for the year 2020: "This renewable electricity supply will come from 900 MW of biomass capacity, at least 3000 MW of offshore wind capacity, 200 MW of onshore wind capacity, and 2,120 GWh (approximately 1,800 MW) of solar energy production."

Renewable Portfolio Standard (RPS)

The NJ Board of Public Utilities sets the Renewable Portfolio Standard for the public utility companies. Currently, the RPS goal states that 2.12% of state's energy consumption will be provided by solar photovoltaics; which is approximately 1,500 MW by the year 2020. This goal has not been updated to coincide with the Energy Master Plan's flat goal of 1,800 MW (instead of a percentage of energy usage, which is expected to drop due to upcoming energy efficiency measures) by the year 2020. It is expected that the RPS goals will be under future review to address goals for year 2021 through 2025.

Regional Greenhouse Gas Initiative (RGGI)

In August 2006, eight Northeast and Mid-Atlantic states (Connecticut, Delaware, Maine, Maryland, New Hampshire, New Jersey, New York, and Vermont) signed an agreement (later joined by two more states, Rhode Island and Massachussetts) for a cap-and-trade program. The goal is to reduce carbon emissions from power supply companies providing energy to these states. Every so often, there will be

a carbon emissions credit sale, where electric generation facilities buy 'allowances' for each ton of carbon dioxide they are allowed to emit. The proceeds of the sale that go to New Jersey will be spent on energy efficiency, renewable energy and other environmental programs that help to meet the state's goals. Each year the number of carbon dioxide allowances will be reduced and the energy facilities will need to take additional measures to reduce emissions. The goal across RGGI is a 10 percent reduction in carbon dioxide emissions by the year 2018. More information can be found at www.rggi.org.

Board of Public Utilities (NJBPU) & Office of Clean Energy (OCE)

The NJBPU ensures safe, adequate and proper utility services; works to create the framework to meet energy conservation and renewable energy; and oversees that services are provided at a reasonable cost to New Jersey ratepayers. The OCE is within the NJBPU and manages the regulatory framework, programs, and research to meet the State's energy efficiency and renewable energy goals. The NJBPU and OCE create programs that address all market sectors (residential and commercial), work with utility companies on their programs, fund some conservation programs through other state agencies, provide educational services and have hired energy consultants to help implement initiatives. The OCE has a strong public stakeholder process and holds monthly program development meetings that are open to the public. More information can be found at www.njcleanenergy.com. The OCE also tracks program performance and the amount of renewable energy installed under their programs.

NJ Housing & Mortgage Finance Agency (NJHMFA)

New Jersey Housing and Mortgage Finance Agency (NJHMFA) is dedicated to increasing the availability of and accessibility to safe, decent and affordable housing for families in New Jersey. This includes financing affordable housing developments and serving New Jersey's most needy families. It also includes working with first time homebuyers, senior citizens in senior and assisted living facilities, and/or the disabled in special needs communities. NJHMFA is dedicated to implementing policies and practices to help transform the market for and aid the development of more sustainable and energy efficient affordable housing. Green affordable housing directly benefits individuals and families by lowering utility costs and creating healthier living environments. Project developers and operators gain both directly and indirectly through higher quality, more efficient, and more durable projects. Green building strategies add value through increased tenant satisfaction, improved marketability, reduced turnover, lower operating costs, and increased longevity. To that end, NJHMFA is placing a higher priority on financing developments that bring about efficient, safe, healthy, prosperous and livable communities while simultaneously maintaining and enhancing the environment. For more information about NJHMFA financing programs visit www.nj-hmfa.com.

NJ Green Homes Office (GHO)

The New Jersey GHO is located at the NJHMFA and provides a dual purpose: (1) to work within NJHMFA and with other state agencies to create new programs and viable financing options for affordable housing developments and (2) to disseminate information to all residents of New Jersey about available residential programs and green building technologies. Trainings, resources, links and programs can be found at www.njgreen.gov.

SOLAR EQUIPMENT

Equipment

- *Solar Panels* are designed to withstand 120 mph winds and typically carry 20 – 25 year warranties. An average panel will guarantee power output at 90% of rated power for the first 10 years and at 80% of rated power until the 20th year.
- *Mounting System* – The solar panels can be placed anywhere on a property where they receive sufficient sunlight. Common locations include carports, awnings, ground arrays and roof systems. For flat roofs, you have the option to install a system with no roof penetrations; it is a ballasted system weighted down with concrete blocks or sandbags, etc. Please be sure to coordinate with your roofer in order to maintain your roof warranty.
- *Inverters* – This is the 'black box' of solar photovoltaics where the DC current created by the solar array is converted to AC current used for most businesses and residences in the United States.
- *DC Isolation Disconnects* – Cut-off boxes located along the conduit system from the solar panels and also before the meter allow for repairs and total disconnect from the utility grid.
- *Conduit System, Combiner Boxes, & Connection to Building's AC Service*
  For more information visit http://www1.eere.energy.gov/solar/photovoltaics.html

Net-Metering

During the day, the electricity produced is first used as needed by the building. If the amount of energy produced is more than the amount needed at that time, then the electricity is returned to the utility grid – reversing the meter (or net-metering, showing only total use) – and used elsewhere. This free-flow of electrons, whether generated by a building's solar PV array or from utility companies, ensures that there is adequate electricity to meet consumer needs at all times. The ability to 'store' solar electricity through the utility grid is possible through a 'net metering' agreement between the system and the utility company. Through rules promulgated by the NJ Board of Public Utility, public utility companies provide a one-to-one retail-rate credit for each kWh produced.

Prior to setting up a 'net-metering' agreement the utility will review the solar PV system plans, determine if a utility line upgrade is needed, provide an interconnection approval and install a net meter. Part of the project review and approval from the utility company is to ensure adequate protections for their utility grid network. Because the solar PV array is interconnected with the utility grid network, security disconnects are installed. During a utility outage, when utility employees need to repair the lines, they need to be certain that no electricity is running through the lines. So, the inverter has an automatic disconnect. Thus, during a utility outage, no electricity will be available via the grid or your solar PV array. The inverter will automatically reactivate once the utility grid is operational.

Steps for Installation

- Engineering – Hire an expert (or engineer) to review roof structure, available space, size a system and create specifications for your project. There may be structural or roof maintenance issues that must be addressed first – or as a part of the installation project. Request several bids using technical specifications.
- Permit and Program applications – Project bids can include more than just solar installation labor and materials. Other services include help in applying for various programs in the state,

applying for municipal permits, addressing additional structural needs, etc.

- Installation – The installation must be completed in accordance with the National Electric Code and program requirements.
- Interconnection Agreement - Prior to requesting inspections, you must submit to your utility for an "Interconnection Agreement." This agreement allows for the interconnection of the solar PV system and may require your utility company to install a net-meter. Review by the utility company includes safety prerequisites, technical review, and utility line upgrades, if needed. The requisite permissions and net-meter replacement should be implemented before the OCE conducts their inspection. The requisite meter must be installed prior to inspection by a local code official.
- Final Inspections – The NJ Office of Clean Energy and your local code official will complete Solar PV inspections. Once a system has passed an OCE inspection and then it is up to the owner to contact their local code official and arrange for the second inspection. For more information, please contact the Renewable Energy Technical Director for the NJ Office of Clean Energy at 732-218-3417.
- Inclusion in SREC trading program (see Section 3) – Contact one of the trading platforms (Clean Power Markets or PJM-GATS) and sign an agreement. If your PV system is larger than 10 kW, then you cannot receive SRECs by estimated production. Once you have created an account with either platform, and have a verified "Interconnection Date" – provided via letter from utility company – you can start uploading electricity production data. For more information, check out the SREC section within this document.

Maintenance

- Do not store anything in front of the inverter or system disconnects. Insure that minimum clearance around the inverter is maintained for proper airflow. The solar panel modules are wired in series, enough for each inverter, and when one section is shaded it affects the performance of all panels wired together. Do not clean during middle of day as the shock of cool water on heated panels could cause them to shatter. It is not generally necessary to clean your panels, as seasonal rains will take care of most of it.

Solar Financing Tool – Section 1

This section will provide you with total install and maintenance costs over 15 years.

1. Insert the cost per watt for your project – this information can be found through bids provided by solar PV installers (Total cost divided by kW system size – divided by 1,000). If you do not have a bid on hand from which to pull this information - we recommend $9/watt. This typically includes materials, labor, electrical drawings and permitting, etc.
2. Insert estimated annual maintenance costs – not including equipment replacement. Annual maintenance costs include annual inspection of wiring, some monies in case roof repairs are needed and not covered under warrantee. If you have a long-term maintenance contract then use the amount provided by the maintenance company.
3. Insert expected cost for inverter replacement around or after year 10 – unless you have a long-term maintenance contract.

ELECTRICITY PRODUCTION

Sizing a System

In order to participate in NJ Office of Clean Energy incentives and to be interconnected under net metering requirements the solar PV system must be sized to produce less energy than the building uses annually.

Compensation for electrical energy production under net metering requirements allow energy to be offset at the retail cost of power. When installing solar PV on new construction projects where there is not a historical consumption established energy needs are determined by projection; otherwise you will review the previous year's utility bills. Upon request, your utility company can provide you with a copy of your bills for the past two years. System size is also limited by available space (total area available and area with appropriate solar orientation). In general, a 10' by 10' area can accommodate 1 kW DC.

Estimated Output

The Easy Way: The National Renewable Energy Laboratory & Renewable Resource Data Center has created an online solar energy output calculator called PV Watts – found at www.nrel.gov/rredc. PV Watts is a reliable standard that is utilized by all NJ programs and the Solar Financing Tool associated with this document. You can go online, type in your system particulars, adjust standard derating factors, select your nearest weather station and receive monthly estimated energy outputs. The accompanying Solar Financing Tool uses the derate that is automatically set in PVwatts (0.77) and the automatic orientation and tilt set up for the tool (180 degrees = south; with a tilt equal to the latitude = Newark or Atlantic City).

Background Calculations: Energy equals Power x Time: (watts) x (hours) = (watt-hours or kilowatt-hours, kWh). To calculate the output of a 20 kW solar PV system you would multiply the power (20 kilowatts) times the number of hours that the system is producing (the hours of minimum solar light/irradiance). A 20 kW system operating for 5 hours would produce 100 kWh. A 100-watt bulb operating for 24 hours would use 2,400 watt-hours or 2.4 kWh.

Estimated production hours for a system is dependent upon the amount of light available (irradiance) at a site, which is based on the local climate, the direction of the solar array (orientation) and relation to the angle of the sun (tilt). Standard irradiance factors are determined by national climate data and measurements at weather stations on the average number of sunny days and hours over years. This factor takes into account cloud cover and climate patterns. The optimal orientation for a solar array is true south, to maximize the entire east-to-west path of the sun. Optimal tilt is generally equal to the latitude of your location (plus 15 degrees to optimize for summer or minus 15 degrees for winter).

Each solar module has a rated DC output. Manufacturers set this rating after testing in a lab at the following parameters: solar cell temperature of 25 degrees Celsius (77 degrees Fahrenheit), solar irradiance of 1,000 W/m2, and an ASTM standard spectrum of light. All follow the same parameters. However these laboratory conditions are not standard in the field and the system needs to be derated based on other factors (beyond solar irradiance, orientation and tilt). Systems are derated by multiplying the following factors:

- Production tolerance – Actual production of a solar panel may differ by +/- 5; that is, a rated system of a 100-watt module could actually perform at between 95 and 105 watts. This can be

due to temperature differences between testing facility and field installation – typically at temperatures higher than 77 degrees Fahrenheit.

- Inverter & Transformer – Derates based on inverter efficiencies when transforming DC to AC power.
- Mismatch, Diodes, Connections & Wiring - Each of these four items are tracked independently; they address line losses and losses resulting from connecting technologies that are not optimized for the connections between pieces.
- Dirt & Dust – This item accounts for losses resulting from dust and debris building up on panels; an item of concern for areas that have a lot of pollution and traffic and not a lot of rain.
- System availability – Accounting for times when the system is not available due to maintenance issues and utility outages.
- Shading – This item is of concern if you are installing in a shady area or when there are multiple rows of solar modules that may shade each other.
- Sun-tracking – A derate for systems that do not have tracking systems – are fixed and not fully optimizing the sun.
- Age – For systems that are older – the factor is set at 1.0 for the first 10 years.

Information about estimating solar output was taken from the following sources:

PV Watts "Changing System Parameters" – *http://rredc.nrel.gov/solar/codes_algs/PVWATTS/system.html*

Xantrex Technology Inc. – "Calculating Actual PV System Output" – www.xantrex.com

Utility Rates

The Solar Financing Tool estimates future electric utility rates based on average state data maintained by the United States Energy Information Administration and data collected by the Department of Energy – from companies producing coal, nuclear, electric and alternate fuels (http://www.eia.doe.gov/cneaf/electricity/epa/average_price_state.xls). Based on past data, the Solar Financing Tool for 2009 estimates 7% utility rate increases. An optional feature allows you to put in your own estimated future utility rate increases.

Solar Financing Tool – Section 2

This section includes the information needed to calculate estimated electricity production and energy savings. We are still collecting historic and actual utility rates from the various utility companies.

1. Insert your system size as a multiple of 2 or 5 (limited by calculations readily available) based on either (a) recommendation by engineer, (b) solar installer report, or (c) available roof space.
2. Choose either the Newark or Atlantic City, NJ weather station
3. Select a utility rate projection; either (a) the U.S. Department of Energy's NJ State average, (b) a NJ Public Utility Company, or (c) an Alternative rate.

   The Alternative rate is where you can insert your projection or a non-regulated utility rate. To do so, please go to the 'Utility' tab in the Solar Financing Tool and insert your data in either 'Column L or M' for years 2009 through 2024. Please keep in mind that ratepayers in a non-regulated utility area are not eligible for OCE incentives, since you do not pay into the program.

NJ SOLAR RENEWABLE ENERGY CERTIFICATES

Solar Alternative Compliance Payment (SACP)

The NJ Board of Public Utilities' Renewable Portfolio Standard requires that NJ public utility companies ensure that 2.12% of total energy sales by the year 2020 comes from solar photovoltaic renewable energy. In addition, the NJ Energy Master Plan calls for 1,800 MW of solar production in the state by the year 2020. This obligation is met through the purchase of Solar Renewable Energy Certificates. But, if there are not enough SRECs available on the market, then the Solar Alternative Compliance Payment is due at an annual accounting. In the past, SACP levels were set by the BPU at $300 for each megawatt-hour of solar energy needed. In 2007, SRECs were selling between $175 and $220 each.

The BPU and Office of Clean Energy want to transition away from solar rebates to financing based on expected SREC production and market sales. One way to accomplish this goal is to solidify SACP values for an 8-year stretch. In June 2008, SACP levels were increased to $711 per megawatt and set for the following 7 years at a 3% decrease each year. The next 8th year SACP level will be set each year; at that time, a determination made if the amount should increase or decrease for the following year.

Solar Renewable Energy Certificates (SRECs)

Once your solar photovoltaic system is installed, inspected and registered in a SREC trading market platform – then you start earning SRECs. Each SREC is equal to one megawatt-hour of energy. Each project receives the full value of the energy produced on its utility bill and simultaneously receives the 'ghost-value' of the SREC (or carbon not released into the air – the environmental attribute of solar electricity). Each project generates SRECs for 15 years after its Interconnection (placed-in-service) date.

One important date to keep track of is the utility Interconnection Approval date. This is when your photovoltaic system is eligible to start net metering and generate SRECs. Look for a letter from your utility company when a utility representative has changed out the meter.

Renewable Energy Certificates (RECs)

All other sources of renewable energy (wind, biomass, hydro-electric, etc.) and solar renewable energy after 15 years of production are able to generate Renewable Energy Certificates. The BPU Renewable Portfolio Standard includes minimum solar renewable energy production as well as minimum amounts of all non-solar renewable energy sources. For example, the Energy Master Plan calls for 30% of energy coming from renewable resources (not specifically solar) by the year 2020. The current trading market price for RECs is significantly less than in the SREC market – however, it is important to note that after 15 years, solar photovoltaic facilities will be able to generate and trade RECs.

SREC Trading

Once a project has been registered with a trading platform then the project owner starts reporting energy production on a monthly basis. This can be done manually from utility bills or automatically from a remote reporting meter. The SREC trading platforms verify production on a random sampling basis each month, certifies credits, and places it into the project's SREC holding. Owners are able to track the

number of SRECs they have and sell them via the spot-market or through a long-term contract. SRECs must be sold within 2 years of generation.

There are two SREC trading platforms, Clean Power Markets and PJM EIS GATS (PJM's Environmental Information Service's – Generation Attributes Tracking System). Any project from this point forward over 10 kW is to apply through GATS and those under 10 kW will be referred to Clean Power Markets. All projects participating in a PSE&G solar loan program will participate in the GATS program. For all other future solar programs; please confirm in which trading platform you should participate. Clean Power Markets is the SREC trading platform in operation for the past few years and is still under contract with the state until September 2009. Details are still being worked out on if/when existing projects will be transitioning from Clean Power Market to GATS. Training in both these trading platforms is offered on a regular basis, please contact program representatives of the Office of Clean Energy for more information.

Link to Clean Power Markets: www.njcleanenergy.com/srec
Link to PJM EIS GATS: www.pjm-eis.com

SREC Market

If you are interested in tracking Solar Renewable Energy Certificate sales it is necessary to compare state goals (see EMP and RPS description within this document) to actual production. As of December 2008, there are currently three operating solar programs in New Jersey, links to all three can be found at www.njcleanenergy.com/renewable-energy/home/home under the Customer On-Site Renewable Energy box in the center of the page:

1. The Customer On-Site Renewable Energy (CORE) program provided rebates for solar PV installations. You can find the 'Paid Projects' report for all completely installed and inspected projects, as well as a 'Committed Projects' report for projects that have a rebate commitment. As of November 2008, 60.63 MW of solar PV have been installed.
   The CORE program ended in 2008. The new program is called the Renewable Energy Incentive Program and provides rebates for systems 50kW or less at varying rates.
2. The SREC-Only program is for projects that are not eligible to participate in the CORE program and wish to be inspected and participate in the SREC market. After clicking on the SREC-Only program link, scroll down to find the 'Weekly Status Reports'. As of November 2008, 44.30 MW of solar PV are approved for installation; but only 0.426 MW have been installed.
3. The PSE&G Solar Loan program is a new program where permanent solar financing is made available based on the number of SRECs produced over the loan term. PSE&G is crediting SRECs at $475 each. Under the PSE&G Solar Loan Program page, look for 'Current Capacity Commitments' for the amount of solar they have approved for financing. As of November 2008, they have committed to 19.08 MW of solar PV installed.

Each of these programs are independent of each other and can cumulatively provide a general idea on the amount of solar installed in New Jersey. In addition, Atlantic City Electric, Jersey Central Power & Light and Rockland Electric are developing their own solar programs which will be released shortly.

SREC Pricing reports are available through the Office of Clean Energy website and provide monthly SREC sales quantities, SREC minimum, maximum and weighted average sales prices. Go to www.njcleanenergy.com; click on the Renewable Energy tab along the top; click on Programs in the blue bar to the left; click on the Solar Renewable Energy Certificate tab; and select SREC Pricing.

Solar Financing Tool – Section 3

This section calculates estimated income from SRECs.

Option 1: This number is for a 15 year fixed price contract.

Option 2: Under this option, you can assume a fixed SREC price over 15 years as a percentage of SACP. When selecting this number, please consider future SACP values (which act as a virtual ceiling for SREC prices), currently traded prices, and long-term contract programs available.

Option 3: For this option, insert individual SREC values for each of the 15 years individually. You can do this by selecting the 'SREC' tab in the Solar Financing Tool and inserting SREC prices for each year in 'Column D.'

FEDERAL TAX CREDITS & DEPRECIATION

Legislation Reference & Summary

The 'Emergency Stabilization Act of 2008' (http://thomas.loc.gov/cgi-bin/query/z?c110:H.R.1424.enr:) on October 3, 2008 included a section (Division B) that extended energy tax credits for an additional 8 years, until year 2016. This provides for commercial and residential tax credits for solar PV installations, solar hot water systems, small wind energy, geothermal heat pumps and other energy efficiency measures. You can review federal and state renewable energy incentives at www.dsireusa.org. This is a great resource that is updated every two weeks and is the main reference for this section of the Solar Financing Handbook.

Residential Renewable Energy Tax Credit. As of January 1, 2009 residents can receive a tax credit against the alternative minimum tax for up to 30% of the total cost (cost minus any other incentives, such as rebates). The credit can carry over to the following year, if not fully used the first year. This is for solar PV systems that are interconnected and inspected in 2009. For systems installed and inspected in 2008, residents receive a tax credit for up to 30% of the cost and not to exceed $2,000. Here is the original language which was updated as indicated in the link in the first paragraph in this section - http://www.dsireusa.org/documents/Incentives/US37F.pdf

Business Energy Tax Credit. The Business Energy Tax Credit was also extended until January 1, 2017 and maintains the 30% tax credit on the total cost minus subsidized incentives.

How to Record and Apply to IRS

Residential Renewable Energy Tax Credit. Complete IRS Form 5695 (http://www.irs.gov/pub/irs-pdf/f5695.pdf) – making sure to use the most up-to-date version that does not limit you to a $2,000 maximum.

Business Energy Tax Credit. Complete IRS Form 3468 (http://www.irs.gov/pub/irs-pdf/f3468.pdf) – making sure to use the most up-to-date version. Please consult with your tax advisor to find out about when these tax credits need to be applied for and any other items as they arise.

Syndicators

It is possible to 'sell' the Energy Tax Credits at the start of project development in order to raise capital for construction costs. For those entities ('syndicators') that have a tax obligation they wish to offset, it may be worth it to set up an ownership structure (or some other sort of agreement) in order to claim tax credits and depreciation. If you have a larger solar PV system, then there is a better opportunity to find a syndicator. The syndicator will offer an amount per dollar value in exchange for the tax credits.

Depreciation

Depreciation is a reduction in value of an asset (solar PV system) due to usage and age (similar to a used car). Under the federal Modified Accelerated Cost-Recovery System solar PV systems are eligible for accelerated depreciation at an equal amount over 5 years. Expiring December 31, 2008, there was a one-time 'bonus' incentive to allow 50% depreciation in the first year – it is no longer in effect.

For more information see IRS Publication 946, IRS Form 4562: Depreciation and Amortization, and Instruction for Form 4562 (www.irs.gov).

Solar Financing Tool – Section 4

This section addresses federal incentives for Solar PV installations.

1. Indicate the dollar value per Residential Renewable Energy Tax Credit or Business Energy Tax Credit dollar actually recouped. If you are claiming the tax credit against your own tax obligations, then insert 1.00. If you are assigning the tax credits to a syndicating entity, then insert the amount per dollar tax credit you are receiving – in the form of 0.XX.
2. Indicate whether you are able to take advantage of Accelerated Depreciation.
3. Note: New Jersey has also enacted an exemption for 100% of the cost of a Renewable Energy system from local property taxes. Contact the NJ Department of Treasury for more information on how to capture this incentive and reduce the assessed value of your property.

Solar Financing Tool – Section 5

This section takes into account a loan that may be needed to cover up-front costs – as well as any available rebates.

1. Insert the amount of the loan you will need to secure.
2. Insert the loan interest rate.
3. Insert fees and charges as a percent of total loan.
4. Indicate whether you are eligible to receive a rebate.

   Note: The NJ Office of Clean Energy is setting rebate levels for the next four years, with the goal of reaching zero by the end of year 2012. In the Solar Financing Tool, go to the 'Rebate' tab and adjust the top rebate box to reflect accurate/current rebate levels. The boxes below are anticipated rebate levels for various blocks in the 2009 program. Next year's program will include variable rebate levels based on program participation rates.
   Visit www.njcleanenergy.com and check current rebate levels.

POWER PURCHASE AGREEMENTS

In a Power Purchase Agreement (PPA), the building owner allows the solar PV owner to install a system on the roof in exchange for reduced energy bills. At the end of the term, the owner has the option to buy the system at a pre-negotiated price. The building owner is not responsible for maintaining the system and details are worked out concerning roof warrantees and damages, etc.

The solar PV owner receives the direct benefits of Solar Renewable Energy Credit sales, Energy Tax Credits, accelerated depreciation, rebates and utility bill credits. The entity that owns the solar PV system is someone who has the means to take advantage of Energy Tax Credits. For reasons similar to syndicators, power purchase companies have mostly funded larger solar PV systems in the past, because the time and funds needed to set up the ownership structure needs to adequately balance expected tax credits and minimum return on investment for the backers.

The building owner receives the benefits of reduced utility bills through the solar PV system owner; who acts as a utility company. The building owner is responsible for the full cost of energy pulled from the 'regulated' utility company (PSE&G, JCP&L, ACE, etc.) and is also responsible, at a negotiated cost, for the solar energy used from the 'solar utility'. The negotiated 'solar utility' rate is typically set as either a fixed increase from the current rate for the term or at a fixed percentage below each year's regulated utility rate.

Solar Financing Tool – Section 6

This section can be used by either party involved in a Power Purchase agreement – so that both sides are informed during negotiations – and is automatically set for 15 years (the SREC life of the PV system). The fields completed in the 'INPUT' tab of the Solar Financing Tool for Sections 1 through 5 are from the point of view of the solar PV system owner.

1. Indicate whether you are participating in a Power Purchase Agreement.
2. Indicate what type of 'solar utility' arrangement you are following.
    a. If participating in Option 1, then insert the percent increase negotiated for the 'solar utility' rate. In this scenario, the Power Purchase Company agrees to limit increases in solar energy prices by a fixed amount. For instance, the building owner would pay current utility rates for the solar energy, but each year the increase in price would be limited to 3%. Non-solar (utility) energy prices could increase more or less than 3%.
    b. If participating in Option 2, then insert the negotiated percent below the regulated utility rate. In this case, non-solar (utility) energy prices could increase or decrease each year and the cost of the solar energy would be a fixed percent below each year's utility rates.
3. Insert the negotiated price for the building owner to buy the solar PV array after the PPA has expired. This amount could be zero.
4. Note: The 'RESULT' tab indicates in Section 6 the cumulative earnings of the solar PV system owner and the total utility cost saved by the building owner. The cumulative earnings of the solar PV system owner includes loan payments, yearly maintenance, inverter replacement, energy tax credit, rebate, depreciation and 'solar utility' payments made by the building owner.
5. Note: The cumulative savings of the building owner is calculated as the total energy saved (energy not paid to the 'regulated' utility, at those rates) minus the amount paid to the 'solar utility'. Please note that in year 15, the amount paid for the solar PV system is deducted from the building owner's utility costs saved and added to the earnings of the solar PV system owner.